

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (TWICE AMENDED) An apparatus coupled [to] between a low speed tester and a device having a first speed faster than a second speed of said low speed tester, wherein said apparatus is configured to allow said low speed tester to perform high speed tests of said device at said first speed exclusively through said apparatus.

4. (AMENDED) The apparatus according to claim 1, further comprising:

a host emulator configured to interface with said device;

and

a test vector generator.

15. (TWICE AMENDED) An apparatus comprising:

means for testing a device having a first speed; and

means for configuring a low speed tester having a second speed slower than said first speed to perform high speed tests of said device at said first speed exclusively through said testing means.

16. (TWICE AMENDED) A method for testing comprising the steps of:

(A) testing a device having a first speed with a host emulator; and

5 (B) configuring a low speed tester having a second speed slower than said first speed to perform high speed tests of said device at said first speed exclusively through said host emulator.

19. (AMENDED) The method according to claim 18, wherein step (B) further comprises:

interfacing [allowing] said host emulator [to interface] with said device under test.

R E M A R K S

Careful review and examination of the subject application are noted and appreciated.

The present invention concerns an apparatus coupled between a low speed tester and a device. The device may have a first speed faster than a second speed of the low speed tester. The apparatus may be configured to allow the low speed tester to perform high speed tests of the device at the first speed exclusively through the apparatus.

SUPPORT FOR THE CLAIM AMENDMENTS

Support for the claim amendments may be found in FIG. 3 of the specification, as originally filed. Thus, no new matter has been added.

OBJECTION TO THE SPECIFICATION

The objection to the specification has been obviated by appropriate amendment and should be withdrawn.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

The rejection of claims 1, 3-8 and 15-19 under 35 U.S.C. §103(a) as being obvious over Hannah '581 in view of Chakradhar et al. '373 (hereafter Chakradhar) has been obviated in part by

appropriate amendment and is respectfully traversed in part and should be withdrawn.

The rejection of claims 2 and 9-12 under 35 U.S.C. §103(a) as being obvious over Hannah '581 in view of Chakradhar '373 and in further view of Chew '260 is respectfully traversed and should be withdrawn.

The rejection of claims 13, 14 and 20 under 35 U.S.C. §103(a) as being obvious over Hannah '581 in view of Chakradhar '373 and in further view of Jenkins et al. '868 (hereafter Jenkins) and U.S. patent Application Publication No. 2002/011516A1 to Lee is respectfully traversed and should be withdrawn.

Hannah teaches an apparatus and method for operating a peripheral device as either a master device or a slave device (Title). Chakradhar teaches a system and method for testing high speed VLSI devices using slower testers (Title). Hannah and Chakradhar alone, or in combination, do not appear to teach or suggest every element of the presently pending claims. Furthermore, the Office Action does not meet the burden of proof that it would be obvious to combine the teachings of Hannah with the teachings of Chakradhar. As such, the present invention is fully patentable over the cited reference and the rejection should be withdrawn.

Assuming, *arguendo*, that it would have been obvious to combine the teachings of Hannah with the teachings of Chakradhar, (for which the Applicants' representative does not necessarily agree), the proposed combination does not disclose every element as arranged in the pending claims. In particular, claim 1 (apparatus) provides testing a device exclusively through the apparatus. FIG. 10 of Chakradhar teaches that a tested circuit 10.2 is stimulated through an input vector block 10.3 using test vectors generated by a test generator block. However, Chakradhar actually teaches away from the pending claims since a slow tester 10.1 directly measures the signals generated by the tested circuit 10.2 in response to the stimulation. Page 7, item 6, line 18 through page 8, line 2 of the Office Action provides additional support for the incorrect arrangement in the proposed combination, "The Examiner maintains, however, that the invention of Hannah being modified by the invention of Chakradhar to include the specifics of the high speed testing therefore the interfaces of Chakradhar would not be modified in the combination of the two references" (Emphasis added by Applicants' representative). The slow tester 10.1 taught by Chakradhar tests the tested circuit 10.2, in part, external to the input vector block 10.3 and the test generator block. Therefore, Hannah and Chakradhar alone, or in combination, do not appear to teach or suggest that a device is tested exclusively through an

apparatus as presently claimed. As such, pending claim 1 is fully patentable over the cited references and the rejection should be withdrawn. For similar reasons, the pending claims 15 (means) and 16 (method) are also fully patentable over the cited references and the rejection should be withdrawn.

Furthermore, pending claim 1 provides an apparatus coupled between a low speed tester and a device. Contrary to the assertion on page 7, item 6, lines 8-13 of the Office Action, Chakradhar does not teach the test generator block being coupled to the slow tester 10.1. In particular, column 9, lines 5-8 of Chakradhar read, "While the conventional technologies focused on improving the speed of the tester, the present invention focuses on generating test vectors *taking into account* the speed limitations of the tester" (Emphasis added). Taking limitations of the slow tester 10.1 into account does not show that there *must* be an interface between the test generator block and the slow tester 10.1. Furthermore, no other text or figures of Chakradhar appear to teach or suggest that the test generator block is coupled to the slow tester 10.1. Hannah appears to be completely silent regarding testing and thus does not teach or suggest anything coupled to a low speed tester. Therefore, Hannah and Chakradhar alone, or in combination, do not appear to teach or suggest an apparatus coupled between a slow tester and a device as presently claimed. As such,

the pending claim is fully patentable over the cited references and the rejection should be withdrawn.

The Office Action does not provide clear and particular evidence that there is some suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the references. The conclusory statement on page 8, lines 15-20 of the Office Action states that, "motivation still exists to combine the two references because the combination would have *provided a method for insuring accurate operation of the USB system* in a way that, as suggested by Chakradhar, would have increased the fault overage and reduced the application time (column 12, lines 40-42) without extra costs of providing a high-speed tester" (emphasis added by Applicants' representative). The above statement does not appear to be technically correct and does not adequately address the issue of motivation to combine. The factual question of motivation can not be resolved on subjective belief and unknown authority. Specifically, column 12, lines 40-42 of Chakradhar (cited in the Office Action) read, "To increase the fault coverage and reduce the test application time, combining at-speed strategies with slow-fast-slow schemes is a viable option." Nothing in the cited lines of Chakradhar, or any other part of Chakradhar or Hannah, appears to teach a means for insuring accurate operation. Chakradhar may

be able to test a device, but testing only produces test results. Hannah appears to be silent regarding insuring accurate operation. The USB system of Hannah either works or it does not. If the USB system begins to operate inaccurately, nothing in Hannah or Chakradhar appears to teach or suggest a means to fix the problem to insure accurate operation. Therefore, the motivation or suggestion based on "insuring accurate operation" does not appear to be valid for combining Hannah with Chakradhar.

Furthermore, asserting improvements (i.e., increased fault coverage, reduced application time and without extra costs) as motivation is a conclusory statement and not evidence. The Office Action does not explain why one of ordinary skill in the art would seek the particular proposed modifications that would result in the improvements. Instead, using the ends to justify the means suggests that the pending claims may have been used as a template to define the proposed modifications that result in the improvements. The improvements then were asserted as motivation for making the modifications. The improvement motivation would lead to an absurd conclusion that all electronic inventions could be obviously combined with Chakradhar since all electronic inventions could benefit from increased fault coverage, reduced application time and without extra costs. Therefore, the

motivation based upon improvements as asserted in the Office Action does not appear to be clear and particular.

Furthermore, the Office Action fails to provide particular findings as to the reasons one of ordinary skill in the art, with no knowledge of the presently claimed invention, would have selected the cited references for combination. The factual inquiry whether to combine references must be thorough and searching. The rigorous application of the requirement for showing the teaching or motivation to combine references is necessary to avoid the subtle but powerful attraction of a hindsight-based obviousness analysis. It is improper, in determining whether a person of ordinary skill in the art would have been led to the combination of references, simply to use that which the inventor taught against its teacher. As such, because the Office Action fails to provide particular findings as to the reasons one of ordinary skill in the art, with no knowledge of the presently claimed invention, would have selected the cited references for combination, the Office Action does not appear to have met the Office's burden of factually establishing a *prima facie* case of obviousness (MPEP §2142).

Furthermore, Hannah and Chakradhar are from different fields of art and thus it is unlikely that one of ordinary skill in either field would consider the references to be analogous.

Obviousness requires the references to be in the same field of the Applicants' endeavor or, if not, then be reasonably pertinent to the particular problem with which the Applicants were concerned (MPEP §2141.01(a)). Hannah is in class/subclass 395/240 with a field of search in: 395/290, 308, 309; and 380/49. In contrast, Chakradhar is in class/subclasses 714/738, 724 with a field of search in: 714/738, 744, 739, 742, 724, 733, 734, 798, 811, 815, 741, 32; and 324/763, 765, 500, 522, 523, 527, 535. By the PTO classification system, Hannah and Chakradhar are clearly not in the same field of art. In addition, no evidence has been provided in the Office Action why two such diverse references would be considered as analogous. Page 8, lines 15-20 of the Office Action asserts that motivation was suggested by Chakradhar. However, no evidence is provided why one of ordinary skill in the art would find the high speed testing (>1 Gb/s in the late 1990's per Chakradhar column 2, lines 4-7) pertinent to test a relatively slower USB slave (12 Mb/s per the USB 1.1 specification). Therefore, there is no clear and particular evidence of suggestion or motivation to combine the references. As such, the Office Action does not make a *prima facie* case that the combination would be obvious and the rejection should be withdrawn.

Claims 2 and 9-12 depend either directly or indirectly from independent claim 1, which is believed to be allowable. As

such, the presently claimed invention is fully patentable over the cited reference and the rejection should be withdrawn.

Claims 13, 14 and 20 depend either directly or indirectly from independent claims 1 or 16, which are believed to be allowable. As such, the presently claimed invention is fully patentable over the cited reference and the rejection should be withdrawn.

Accordingly, the present application is in condition for allowance. Early and favorable action by the Examiner is respectfully solicited.

The Examiner is respectfully invited to call the Applicants' representative should it be deemed beneficial to further advance prosecution of the application.

If any additional fees are due, please charge our office Account No. 50-0541.

Respectfully submitted,

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